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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/901,428
Filing Date: July 09, 2001
Appellant(s): WHITEHOUSE ET AL.

Tuvia Rotberg
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on April 06, 2009 appealing from the Office action mailed on June 17, 2008.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

U.S. Patent No. 6,285,027

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 99 and 115.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office

action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

6,285,027 Chernushevich et al. 9-2001

(9) Information Required by BPAI (Board Patent Appeal Interference)

Before any interference may be referred to the BPAI (Board Patent Appeal Interference), appelant must provide information required under 37 CFR 41. 202(a) (1) through (a) (6).

(10) Correction of Continuation Data

The current application is a continuation of U.S. Patent Application Serial No. 09/676,124 filed on September 29, 2000, which is a continuation of U.S. Patent Application Serial No. 08/694,542 filed on August 09, 1996, ***but it is NOT a continuation of U.S. Patent Applications Serial Nos. 09/373,337, 08/794,970, 08/645,826 and 08/202,505***.

Since, the applications are not copending, the benefit claim to the prior-filed application is improper. Appelant is therefore required to delete the reference to the prior-filed application from the first sentence(s) of the specification, or the application data sheet, depending on where the reference was originally submitted, unless appelant can establish copendency between the applications.

(11) Objected Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, **a delay provided between the release of the pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument and means as an element or a device for adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio** as recited in claims 99 and 115 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the appelant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

(12) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Rejection Under 35 U.S.C. 112, First Paragraph

Claims 99 and 115 are stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification is completely silent in reciting and teaching the following limitations: a) "means for providing a delay between the release of the pulses of trapped ions and initiation of pulses or push-pull pulses in the Time-Of-Flight instrument," and b) "means for adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio" as recited in claims 99 and 115. There are no supports in the specification to enable the skilled artisan to understand how the delay that is provided between the pulses of the release of trapped ions and initiation of pulses or push-pull pulses in the Time-Of-Flight instrument; and what the element or device that is

used to adjust the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio.

However, on page 24, lines 8-10; and page 26, line 6 to page 27, line 5 of the specification disclose that the length of an ion packet is controlled by controlling the time duration of the ion release from an ion guide exit to improve the duty cycle of ions. This disclosure does not teach or mention "a delay" and/or "the element or the device that is used to adjust the delay".

Additional supports and descriptions are needed if appelant insists on including these features in claims 99 and 115 without the introduction of new matter.

Rejection Under 35 U.S.C. 102(e)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 99 and 115 are stand rejected under 35 U.S.C. 102(e) as being anticipated by Chernushevich et al. (6,285,027).

Chernushevich et al. (6,285,027) discloses a method of effecting mass analysis on an ion stream (see col. 10, line 4), which includes:

(a) passing the ion stream through a first mass resolving spectrometer to select parent ions having a first desired mass to charge ratio (see col. 10, lines 6-8);

(b) subjecting the parent ions to collision induced dissociation to generate fragment ions (see col. 10, lines 9-10);

(c) trapping the fragment ions and any remaining parent ions (see col. 10, lines 11-12);

(d) periodically releasing pulses of the trapped ions into a Time-Of-Flight instrument to detect ions with a second mass to charge ratio (see col. 10, lines 13-15); and

(e) providing a delay between the release of the pulses of trapped ions and initiation of pulses or push-pull pulses in the Time-Of-Flight instrument, and adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio (see col. 10, lines 16-20).

(13) Response to all of Appellant's arguments appearing to center on the following features:

First argument: Appellant argues that not all ion packets travel from the ion guide to the pulsing region at the same speed. A heavier packet will travel slower, and thus will require more time to arrive in the pulsing region, as compared to a lighter packet. Therefore, the different timing travels of the ion packets provide a delay between the release of pulses of trapped ions and the initiation of pulses in the Time-Of-Flight instrument.

Response to the first argument: This argument is not persuasive. Since all ion packets including light, medium, and heavy ion packets travel in the same electric field region between the exit lens 27 and the pulsing region 30, these ion packets having the

same energy and different mass to charge ratio values are require different timing travels to arrive the pulsing region 30 from the exit lens 27. As stated on page 26, lines 12-13 of the instant specification,

> *"Separation has occurred due to the velocity differences of ions of different m/z values having the same energy".*

Therefore, the different timing travels are due to the velocity differences but not due to providing a delay that is between the release of the pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument.

Second argument: Appellant argues that the timing of one event being the release of pulses of trapped ions with respect to a second event being the Time-Of-Flight pulse imposes the time relation between the two events. The one which is later than the other is a delay. This time relation is used to describe "a delay provided between the release of pulses of trapped ions and the initiation of pulses in the Time-Of-Flight instrument".

Response to the second argument: This argument is not persuasive. Since using the time relation between the timing of two events, one being later than the other, and to describe a delay is unclear. Because the Time-Of-Flight instrument is positioned behind the ion guide, thereby the timing of initiation of pulses in the Time-Of-Flight instrument must happen after the timing of the release of pulses of the ion guide. If the timing of initiation pulses in the Time-Of-flight instrument occurs earlier than or the same time with the timing of the release pulses of the ion guide, then the ions will not arrive to the detector from the pulsing region.

Further, the instant specification does not disclose or mention a delay which is defined as "the time relation between two events-one being the release of pulses of trapped ion and the other being the initiation of pulses in the Time-Of-Flight instrument," "one event being later than the other," or "one event being delayed with respect to the other".

As the release of pulses of trapped ions and the initiation of pulses in the Time-Of-Flight instrument are operated in different timing, one skilled in the art can not compare or define the different timing operations of two different elements to have a delay as one being later than the other, or one being delayed with respect to the other. Therefore, one of these terms, such as "the time relation between the timing of two events," "the timing of one event being later than the other," or "the timing of one event being delayed with respect to the other," is not considered as a delay that is provided between the release of the pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument.

Third argument: Appellant argues that the terms "providing" and "adjusting" are linked, such that a finding of support for the term "providing" will also support the limitation of "adjusting".

Response to the third argument: This argument is not persuasive.

Since the terms "providing a delay" and "adjusting the delay" are operated by two different elements or devices having different functions, they are not linked between the terms "providing" and "adjusting". Further, the instant specification is completely silent in

disclosing or mentioning the term "providing a delay," the term "adjusting the delay," or any word that is relative to the term "delay" and/or the term "adjusting the delay".

Fourth argument: Originated from the instant specification, appellant included the following quotations:

On page24, lines 8-10 which state:

> *Instead, trapping and the timed release of ions* from the multipole ion guide i*s a preferred method for improving duty cycle.*

And on page 26, line 6 to page 27, line 5 which state:

> By either trapping method, ions continuously enter ion guide 16 even while ion packets are being pulsed out exit end 24. *The time duration of the ion release from ion guide exit 24 will create an ion packet 52 of a given length as diagrammed Figure 2. As this ion packet moves through lenses 27 and into pulsing region 30 some m/z TOF partitioning can occur as diagrammed in Figure 3.* The m/z components of ion packet 52 can occupy different axial locations in pulsing region 30 such as separated ion packets 54 and 56 along the primary ion beam axis. Separation has occurred due to the velocity differences of ions of different m/z values having the same energy. The degree of m/z ion packet separation is to some degree a function of the initial pulse duration. The longer the time duration that ions are released from exit 24 of ion guide 16, the less m/z separation that will occur in pulsing region 30. *All or a*

> *portion of ion packet 52 may fit into the sweet pot of pulsing region 30. Ions pulsed from the sweet pot in pulsing region 30 will impinge on the surface of detector 38.* If desired, a reduced m/z range can be pulsed down flight tube 42 from pulsing region 30. *This is accomplished by controlling the length of ion packet 52 and timing the release of ion packet 52 from ion guide 16 with the TOF pulse of lenses 34 and 35. A time separated m/z ion packet consisting of subpackets 54 and 56 just before the TOF ion pulse occurs is diagrammed in Figure 3.* Ion subpacket 56 of lower m/z value has moved outside the sweet spot and will not hit the detector when accelerated down flight tube 42. Ion subpacket 57, originally subpacket 54, are shown just after the TOF ion pulse occurs. These subpackets will successfully impinge on detector 38. *The longer the initial ion packet 52 the less mass range reduction can be achieved in pulsing region 30. With ion trapping in ion guide 16, high duty cycles can be achieved* and some degree of m/z range control in TOF analysis can be achieved independent or complementary to mass range selection operation with ion guide 16.

Appellant argues that the above quotations include "… timing the release of ion packet 52 from ion guide 16 with the TOF pulse of lenses 34 and 35. A time separated m/z ion packet consisting of subpackets 54 and 56 just before the TOF ion pulse occurs

is diagramed in FIG. 3" which is expressed the same as "providing a delay between the release of pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument."

Response to the fourth argument: This argument is not persuasive.

This quotation "... timing the release of ion packet 52 from ion guide 16 with the TOF pulse of lenses 34 and 35. A time separated m/z ion packet consisting of subpackets 54 and 56 just before the TOF ion pulse occurs is diagramed in FIG. 3" is completely silent in disclosing or mentioning the limitation of "providing a delay between the release of pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument".

Since the ions in the ion packet 52 with a reduced m/z (mass to charge ratio) range are fitted into the sweet spot of the pulsing region 30, the ions, that are fitted into the sweet spot, will be pulsed down to flight tube 42, as expressed in following statements:

> **"The time duration of the ion release from ion guide exit 24 will create an ion packet 52 of a given length as diagrammed FIG 2"** (see page 26, lines 7-8),
>
> **"The degree of m/z ion packet separation is to some degree a function of the initial pulse duration. The longer the time duration that ions are released from exit 24 of ion guide 16, the less m/z separation that will occur in pulsing region 30"** (see page 26, lines 13-15),

> **"If desired, a reduced m/z range can be pulsed down flight tube 42 from pulsing region 30. This is accomplished by controlling the length of ion packet 52 and timing the release of ion packet 52 from ion guide 16 with the TOF pulse of lenses 34 and 35"** (see page 26, lines 17-19), and
>
> **"The longer the initial ion packet 52 the less mass range reduction can be achieved in pulsing region 30. With ion trapping in ion guide 16, high duty cycles can be achieved and some degree of m/z range control in TOF analysis can be achieved independent or complementary to mass range selection operation with ion guide 16"** (see page 27, lines 2-5).

In addition, all above statements in the instant specification disclose that the length of an ion packet is controlled by controlling the time duration of pulses of the ion release from an ion guide exit to improve the high duty cycle. This disclosure does not teach or mention "a delay" and/or "the element or the device that is used to adjust the delay".

Fifth argument: Appellant argues that the support for "Adjusting the Delay ..." in step (e) is found in the following statement from the instant specification on page 26, line 6 to page 27, line 5:

"All or a portion of ion packet 52 may fit into the sweet spot of pulsing region 30. Ions pulsed from the sweet spot in pulsing region 30 will impinge on the surface of

detector 38," which supports for the second part of step (e) "adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio".

Response to the fifth argument: This argument is not persuasive.

The above quoted statement is completely silent for supporting the second part of step (e) "adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio" as recited in claims 99 and 115.

Also stated in the instant specification, "The longer the time duration that ions are released from exit 24 of ion guide 16, the less m/z separation that will occur in pulsing region 30" (see page 26, lines 14-15) .And "The longer the initial ion packet 52 the less mass range reduction can be achieved in pulsing region 30." (see page 27, lines 2-3).

Further, as discussed in the fourth argument's response, the length of the ion packet 52 is controlled by controlling the time duration of pulses of the ion release from an ion guide exit to have ions with less mass range reduction that are fitted in the sweet spot of the pulsing region and are pulsed down to the detector for improving the high duty cycle of ions.

Hence, the above quotation does not disclose a support for the limitation of "adjusting the delay to improve the duty cycle efficiency of ions with the second mass to charge ratio" for second part of step (e).

Sixth argument for Objected Drawings: Appellant argues that the claims pending in the application are method claims. As such there are no particular features or devices that are "providing a delay between the release of the pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument," and "adjusting the delay to

improve the duty cycle efficiency of ions with the second mass to charge ratio". However, Appellant claims "the step of providing" and "the step of adjusting" and not a means of "providing" and "adjusting".

Response to the sixth argument for Objected Drawings: This argument is not persuasive.

Since the claims 99 and 115 recite a method of operating a mass spectrometer but not a method of processing chemical molecules, thus all features that are used to operate the mass spectrometer must show on the Drawing(s). Otherwise, such features have to be cancelled from the claims 99 and 115.

Additionally, at least one element or device is provided between the release of the pulses of trapped ions and initiation of pulses in the Time-Of-Flight instrument to perform a delay; and at least another element or device is communicated to the element or device, which is just mentioned, for adjusting the delay. A delay in the claims 99 and 115 is a special element or device that operates to hold ions in a period of time and the other element or device that operates to adjust the holding time. Therefore, the delay element or device and the adjusting delay element or device must show in the Drawing(s).

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Kiet Tuan Nguyen/

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